Intramembranous Ossification

Starts in OSSIFICATION CENTER and radiates toward periphery

1. Begins in VASCULAR MESENCHYME
- In fetus: layer under the skin
- Mesenchymal Cells
  - Pluripotent
  - Differentiate from osteoprogenitor cells
- Many small blood vessels
- Group together in vascular mesenchyme
- Round up to make cellular contact with adjacent cells
  - Reach out via cytoplasmic processes, maintained even as osteoid is secreted
  - Basophilic cells because contain lots of rER
- Secrete unmineralized bone matrix=osteoid
  - Increase in matrix forces cells further apart

2. Mineralization of Osteoid

Bone Island formed
- Equidistant from blood vessels
- Osteoblasts become embedded in mineralized matrix=osteoclasts
- New layer of osteoblasts line the surface of bone island and lay down osteoid
  - Osteoblasts come from surrounding osteoprogenitor cells in mesenchyme
- increase size due to appositional growth
  - Separate islands enlarge until they touch to form trabecula
  - Appositional growth enlarges islands and lengthens trabecula
    - Trabecular bone formation
      - Spongy, cancellous bone
      - Not straight, follow windiing route of blood vessels

3. Compaction
- Formation of Compact bone from
- Continuation of laying down of new layers of osteoid and osteocytes on trabecula
- Primitive osteons
  - Slow build up of trabecula
  - Edges of adjacent trabecula meet
  - Concentric rings of osteocytes

Woven bone (immature, primary bone)
- Collagen Type I is in Interwoven bundles
- NOT in layers of parallel fibers (Lamellar bone)

Spongy bone
- Skull bones until age 8
- Gradually remodeled into inner and outer tables of compact bone
- Cortical bone (dense) are separted by a middle layer, the diploe=spongy bone